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TECHNOLOGY WILL REVOLUTIONIZE FORECASTING

Langley GIFTS Will Provide Better Weather Information

Future meteorologists will be able to better predict the weather, especially hurricanes and tornadoes, because of new technology being developed at the NASA Langley Research Center in Hampton, Va.

Langley researchers will build and flight-test an instrument called the Geostationary Imaging Fourier Transform Spectrometer or GIFTS. Set for launch in 2003, GIFTS will measure elements of the Earth's atmosphere and support space research aimed at reducing risks from severe weather. It will be the third Earth-observing mission under NASA's New Millennium Program and part of NASA's ongoing effort to help science better understand our planet.

The mission will test advanced technologies for measuring temperature, water vapor, wind and chemical composition of the atmosphere. High-resolution measurements will be taken over time in space and beamed down to Earth by satellite. Weather information transmitted by GIFTS will be equivalent to that obtained by launching 100,000 weather balloons every minute at intervals of two miles. The system will also track the motion of clouds and atmospheric pollutants. This kind of in-depth, up-to-the-minute information could revolutionize weather forecasting and improve the accuracy of three and five day predictions.

The GIFTS measurement concept was developed by Dr. William L. Smith, Chief Atmospheric Scientist, at NASA Langley together with scientists at the Cooperative Institute for Meteorological Satellite Studies at the University of Wisconsin–Madison and the Space Dynamics Laboratory of Utah State University.

GIFTS will take atmospheric observation and prediction forward by a quantum jump in just a few years, according to Smith. "GIFTS will greatly improve environmental forecasts and reduce the risk of hazardous weather and poor air quality to human safety and heath," said Smith.

The program will be managed by Langley under the leadership of Wallace Harrison. Dr. Henry Revercomb of the University of Wisconsin–Madison and Dr. Gail Bingham of Utah State University are the co-investigators responsible for critical engineering and technology components of GIFTS.

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The mission uses an advanced imaging spectrometer that incorporates breakthrough technologies, including large-area format focal-plane detector arrays and new data-readout and signal-processing electronics. ASRC, Inc., Composite Optics, Inc., Honeywell, Irvine Sensors, Inc., ITT, Jet Propulsion Laboratory, Lockheed Martin, Massachusetts Institute of Technology's Lincoln Laboratory, Raytheon, Space Electronics, Inc., SSG, Texas A&M University, TRW, and the University of New Mexico and engineers at Langley will supply components for the GIFTS system.

The National Oceanic and Atmospheric Administration, the NASA Aviation Safety Program and American Airlines are also part of the GIFTS mission. NOAA's National Weather Service and National Environmental Satellite Data and Information Service will validate weather forecasting improvements. The Aviation Safety Program and American Airlines will document how GIFTS observations help pilots steer clear of potentially hazardous weather and whether better flight level wind information, particularly over data sparse oceanic regions, improves fuel management.

The public will see some direct benefits thanks to GIFTS' education and outreach program. Th4 program will offer enhanced meteorology data to television weather forecasters. It will also work with museums including the Virginia Air and Space Center on meteorology exhibits and partner with Norfolk State University to enhance teacher education and student participation in national programs such as Global Learning and Observations to Benefit the Environment (GLOBE). GIFTS outreach is managed by Dr. Sanjay Limaye, University of Wisconsin, and locally by Dr. Arlene Levine, Outreach and Education Manager for Langley's Atmospheric Science Competency.

Langley's design was one of four finalists out of 24 proposals submitted in response to a NASA research announcement. NASA was looking for innovative approaches for observing the Earth's surface and atmosphere from positions outside low-Earth orbits, with an emphasis on advanced measurement concepts and technologies NASA Headquarters was in charge of the selection process which included evaluations by external peer reviewers. The total NASA cost of the mission, including contribution to launch, is expected to be about $105 million.

More information on NASA's New Millennium Program is available at http://nmp.jpl.nasa.gov.

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